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| 09/856,414 | 05/18/2001 | Johann Engelhardt | 21295/24 | 7891 |

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HOUSTON ELISEEVA
4 MILITIA DRIVE, SUITE 4
LEXINGTON, MA 02421

| EXAMINER |
|---|
| CHANG, SUNRAY |

| ART UNIT | PAPER NUMBER |
|---|---|
| 2121 | |

DATE MAILED: 08/06/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

-- *The MAILING DATE of this communication appears on the cover sheet with the correspondence address* --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE _3_ MONTH(S) FROM
THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed
  after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
  Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any
  earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on _18 May 2001_.

2a)☐ This action is **FINAL**.          2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is
   closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) _1-15_ is/are pending in the application.

   4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) _1-15_ is/are rejected.

7)☒ Claim(s) _1,2,5 and 7_ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on _18 May 2001_ is/are: a)☒ accepted or b)☐ objected to by the Examiner.

   Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

   Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

   a)☒ All   b)☐ Some *  c)☐ None of:

   1.☐ Certified copies of the priority documents have been received.

   2.☐ Certified copies of the priority documents have been received in Application No. _____.

   3.☒ Copies of the certified copies of the priority documents have been received in this National Stage
      application from the International Bureau (PCT Rule 17.2(a)).

   * See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
   Paper No(s)/Mail Date _20010518_.

4) ☐ Interview Summary (PTO-413)
   Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

## DETAILED ACTION

1.      Claims 1 – 15 are presented for examination.

Claims 1 – 15 are rejected.


### *Claim Objections*

2.      **The claims 1 and 2 are objected to** because they include reference characters, which are not

enclosed within parentheses.

Reference characters corresponding to elements recited in the detailed description of the

drawings and used in conjunction with the recitation of the same element or group of elements in the

claims should be enclosed within parentheses so as to avoid confusion with other numbers or

characters which may appear in the claims.  See MPEP § 608.01(m).


3.      **Claims 5 and 7 are objected to** because of the following informalities: The terms **[and the]**

and **[?is such that]** are not related with anything useful discloser of the claims.  Appropriate

correction is required.


### *Claim Rejections - 35 USC § 112*

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.


4.      As to claim 1 – 15, there is insufficient antecedent basis for this limitation in the claim. For

example, applicants recite the limitation "the system parameters" (Line 1), "the following steps" (Line

3) and "the user" (Line 4) of claim 1, "the input" in first line of claim 2, are not previously cited.

5.      As to dependent claim 2, applicants recite the limitation "the input" in first line of claim 2.

There is insufficient antecedent basis for this limitation in the claim. The "the input", in first line of

claim 2, is not previously cited.

6.      As to dependent claim 3, applicants recite the limitation "detection method" in first line of claim

3. There is insufficient antecedent basis for this limitation in the claim. The "detection method", in first

line of claim 3, is not previously cited.

7.      As to dependent claim 5, applicants recite the limitation "specimen property" in first line of

claim 5.  There is insufficient antecedent basis for this limitation in the claim. The "specimen

property", in first line of claim 5, is not previously cited.

8.      As to dependent claim 6, applicants recite the limitation "setting a detection pinhole diameter"

in first line of claim 6.  There is insufficient antecedent basis for this limitation in the claim. The

"setting a detection pinhole diameter", in first line of claim 6, is not previously cited.

9.      As to dependent claim 10, applicants recite the limitation "assistance or solutions" in first line of

claim 10.  There is insufficient antecedent basis for this limitation in the claim. The "assistance or

solutions", in first line of claim 10, is not previously cited.

10.     Dependent claims which are not particularly rejected are rejected based on rejected base

claim.

### Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis

for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

11.    **Claims 1 – 5, 7, 8 and 13 – 15** are rejected under 35 U.S.C. 102(b) as being anticipated by

Christopher R. Fairley et al. (PCT/US95/00665, Appendix G, A Method And Apparatus For

Performing An Automatic Focus Operation, June 3rd, 1994, And referred to as **Fairley** hereinafter).

12.    Regarding independent claim 1, Fairley teaches a method for setting the system parameters of

a confocal laser scanning microscope; [Page 309, Line 10 – 13]

- creation of a user interface interactively with the user; [Page 319, Line 5]

- input of at least one specimen parameter, at least one selectable system parameter by the

user, at least one definable problem regarding image acquisition; [Page 309, Line 11 – 18]

- proposal of other system parameters, optimization paths, and imaging strategies regarding

image acquisition; [Page 309, Line 21 – 23]

- selection of a proposal by the user; [Page 309, Line 14 – 16]

- automatic setting of the system parameters of a selected system setting or imaging strategy.

[Page 309, Line 10 – 11]

13.    Regarding dependent claim 2, Fairley teaches the input of at least one of the following

parameters determines the specimen dimension [specific type of wafer] to be imaged, the specimen

region [specific type of wafer] to be imaged, the number of optical steps [process step], the specimen

property [specific type of wafer] to be imaged, and the detection method [number of slices of data].

[Page 309, Line 20 – 26]

14.    Regarding dependent claim 3, Fairley teaches the detection method involves alternatively the

use of a fluorescence method [Page 312, Line 20 – 21] and a reflection method [Page 312, Line 24].

15.    Regarding dependent claim 4, Fairley teaches the proposal step [recipe] concerns the use of a

suitable objective [properly specified recipe] having the highest possible numerical aperture [camera

intensity, Page 326, Line 7]; the maximum resolution [laser scan x, y solution] achievable with the

selected objective, [Page 325, Line 14 – Page 326, Line 18]

Fairley further teaches, the present resolution on the basis of specific and previously set

system parameters [most of the optic parameters], are reported to the user [Page 325, Line 15 – 20];

and the number of pixels [number of slices] per image plane is proposed to the user [loaded into the

LIS]. [Page 326, Line 6 – 12]

16.    Regarding dependent claim 5, Fairley teaches the specimen property [sample thickness] to be

determined serves to ascertain the optimum irradiation intensity [laser intensity]; optimum irradiation

intensity [laser intensity] is proposed to the user [loaded into the LIS where the recipe is load]. [Page

326, Line 6 – 12]

17.    Regarding dependent claim 7, Fairley teaches the interface upon selection of a creation of the

user t least one system parameter all those system. parameters that are influenced by the selection

are presented for the user, [Customize and automate many of the instruments function, Page 325,

Line 14 – 15]

Fairley further teaches, the user is also informed as to how, on the basis of the selection of a system parameter, an image acquisition can be performed with the best possible quality. [each recipe's screen is given a descriptive name, Page 325, Line 27 – 28]

18.     Regarding dependent claim 8, Fairley teaches at least one criterion that is important for the application can be defined for the optimization thereof [autofocus position to the ideal viewing position may also be preset, Page 25 – 26]; and that based on this definition, the further system parameters are interactively proposed and/or automatically set [the laser wavelength, and power, to be used maybe selected, Page 309, Line 22 – 23].

19.     Regarding dependent claim 13, Fairley teaches the system parameters [scan parameters] are retrieved [setup], in consideration of the definitions, from an expert system stored in a database [By loading a properly specified recipe, the user can setup the LIS with the exact screen layout and scan parameters, as well as defect sort criteria, without any user input, Page 325, Line 15 - 20].

20.     Regarding dependent claim 14, Fairley teaches the system parameters [scan pamrameters] are ascertained [exact], in consideration of the definitions, using fuzzy logic [if the recipe is found], and are set after selection or automatically [customize and automate]. [Page 325, Line 14 – 20]

21.     Regarding dependent claim 15, Fairley teaches an activatable [automatic operation] and interfacing teaching program [pre-programmed] for optimal - preferably specimen-specific [specific type of wafer] and/or problem specific [laser wavelength, power] - system setting [slices of data, spacing] and/or imaging strategy [autofocus] [Page 309, Line 20 – 26].

## *Claim Rejections - 35 USC § 103*

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness

rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* v. *John Deere Co.*, 383 U.S. 1, 148 USPQ 459

(1966), that are applied for establishing a background for determining obviousness under 35

U.S.C. 103(a) are summarized as follows:

1.    Determining the scope and contents of the prior art.
2.    Ascertaining the differences between the prior art and the claims at issue.
3.    Resolving the level of ordinary skill in the pertinent art.
4.    Considering objective evidence present in the application indicating obviousness or nonobviousness.


22.    **Claims 6 and 9 – 12 are rejected** under 35 U.S.C. 103(a) as being unpatentable over Failey,

and in view of Timothy V. Thompson (U.S. Patent No. 5,483,055, and referred to as Thompson

hereinafter).

(Fairley as set forth above generally discloses the basic inventions.)


23.    **Regarding Claim 6**, Fairley teaches setting a detection pinhole diameter, an optimized value

at which the image acquisition resolution is maximal [pinhole whose diameter has been selected,

Page 311, Line 16 - 17].

Fairley does not teach the image acquisition signal-to-noise ratio.

Thompson teaches an optimized value [idealized graph] at which the image acquisition resolution is maximal [full width half max measurement], while the image acquisition signal-to-noise ratio [301, 303, Fig. 3a] is still usable. [Col. 4, Line 20 – 29]

It would have been obvious to a person of ordinary skill in the art at the time of applicant's invention to modify the teaching of Fairley to include "image acquisition signal-to-noise ratio" with the motivation being to provide for the purpose of performing an accurate, reliable, high-speed, auto-focus operation.

24.     **Regarding Claim 9**, Fairley teaches predefined criterion [Page 309, Line 26].
        Fairley does not teach the signal-to-noise ratio.

Thompson teaches signal-to-noise ratio [301, 303, Fig. 3a].

It would have been obvious to a person of ordinary skill in the art at the time of applicant's invention to modify the teaching of Fairley to include "signal-to-noise ratio" with the motivation being to provide for the purpose of performing an accurate, reliable, high-speed, auto-focus operation.

25.     **Regarding Claim 10**, Fairley teaches user interface [Page 319, Line 5].
        Fairley does not teach assistance or solutions for predefined problem situations are offered by means of the user interface.

Thompson teaches assistance or solutions [second range of motion that is chosen] for

predefined problem situations [move to the location at which the maximum absolute value of the

electronic focus signal in the second range of motion was measured]. [Col. 2, Line 33 – 41]


It would have been obvious to a person of ordinary skill in the art at the time of applicant's

invention to modify the teaching of Fairley to include "assistance or solutions for predefined problem

situations are offered by means of the user interface" with the motivation being to provide for the

purpose of performing an accurate, reliable, high-speed, auto-focus operation.


26.    **Regarding Claim 11**, Fairley teaches a method for setting the system parameters of a

confocal laser scanning microscope; [Page 309, Line 10 – 13].

Fairley does not teach the following problems:

- "the specimen [in the case of fluorescence specimens] bleaches excessively"; and/or

- "the image data are noisy"; and/or

- "the measurement time is too long"; and/or

- "situations are "the resolution is too low."


Thompson teaches

- "the specimen [in the case of fluorescence specimens] bleaches excessively" [intensity, Col. 1,

  Line 34]; and/or

- "the image data are noisy" [contrast, Col. 1, Line 47]; and/or

- "the measurement time is too long" [slow, Col. 1, Line 46]; and/or

- "situations are "the resolution is too low." [accuracy, Col. 1, Line 56]

It would have been obvious to a person of ordinary skill in the art at the time of applicant's invention to modify the teaching of Fairley to include "the specimen [in the case of fluorescence specimens] bleaches excessively"; and/or "the image data are noisy"; and/or "the measurement time is too long"; and/or "situations are "the resolution is too low." with the motivation being to provide for the purpose of performing an accurate, reliable, high-speed, auto-focus operation.

27.     **Regarding Claim 12**, Fairley teaches a method for setting the system parameters of a confocal laser scanning microscope; [Page 309, Line 10 – 13].

Fairley does not teach mutually dependent system parameters are determined by means of an algorithm.

Thompson teaches mutually dependent system parameters are determined by means of an algorithm [because there is a certain amount of over shoot associated with stopping the relative motion between the target and the objective lens, several successive iterations can be performed to position the target closer to the focus position, Col. 2, Line 24 – 27].

It would have been obvious to a person of ordinary skill in the art at the time of applicant's invention to modify the teaching of Fairley to include "mutually dependent system parameters are determined by means of an algorithm" with the motivation being to provide for the purpose of performing an accurate, reliable, high-speed, auto-focus operation.

## *Conclusion*

28.    The prior art made of record and not relied upon is considered pertinent to applicant's

disclosure. Fairley et al. (U.S. Patent No. 5,672,861) discloses automatic focusing of a confocal laser

microscope, intensive, focus position, aperture, contrast. Fairley et al. (U.S. Patent No. 5,783,814)

discloses automatic focusing of a confocal laser microscope, intensive, focus position, aperture,
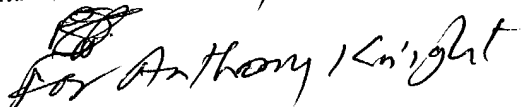
contrast.


29.    Any inquiry concerning this communication or earlier communications from the examiner

should be directed to Sunray Chang whose telephone number is 703-305-8744.  The examiner can

normally be reached on M-F 7:00-4:30.

      If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor,

Anthony Knight can be reached on (703)308-3179.  The fax phone number for the organization

where this application or proceeding is assigned is 703-872-9306.

      Any inquiry of a general nature or relating to the status of this application or proceeding should

be directed to the receptionist whose telephone number is 703-746-3506.


Sunray Chang
Patent Examiner
Group Art Unit 2121
Technology Center 2100
U.S. Patent and Trademark Office

July 28, 2004

RAMESH PATEL
PRIMARY EXAMINER   7/30/04

for Anthony Knight